

REMARKS

Applicant respectfully requests reconsideration of this application in view of the foregoing amendment and following remarks.

Status of the Claims

Claims 1-4 are pending in this application. Claim 1 is independent. All of the pending claims stand rejected. By this amendment, claim 1 is amended. New claim 5 is added. No new matter has been added by this amendment.

Rejection under 35 U.S.C. §103 (a)

Claims 1-4 have been rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 7,050,101 to Wako et al. ("Wako") in view of U.S. Patent No. 6,476,941 to Kondo ("Kondo").

The Office Action indicates, *inter alia*, that Wako discloses "a driving circuit (not shown) which while the signal charges are stored in the photoelectric conversion portion 15, stops providing the horizontal transfer pulse to the horizontal transfer portion 30, and drains the unnecessary charges generated at the vertical transfer portions of said image sensing element through the horizontal drain portion (Fig. 5 and C11 L13-33)."¹ The Office Action then admits that Wako does not teach the horizontal drain portion only drains charges if the unnecessary charges are transferred over a tolerance of the horizontal transfer portion.² The Office Action cites Kondo (i.e., col. 14, lines 5-16) as disclosing this missing element.

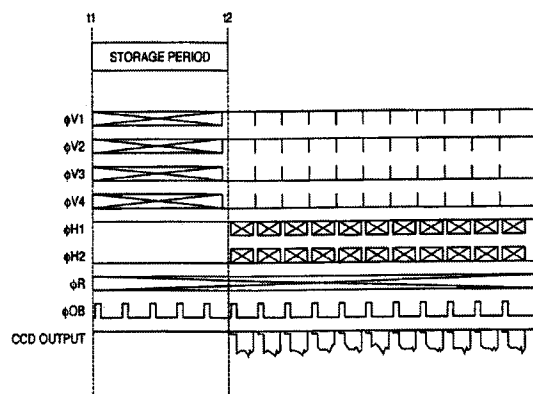
First of all, Applicant notes that one of the inventive aspects of the image sensing apparatus as recited in claim 1 resides a provision during the signal charges are stored. For example, claim 1 recites, *inter alia*, "a driving circuit which, while the signal charges are stored

¹ Page 3 of the Office Action.

² Page 4 of the Office Action.

in the photoelectric conversion portion, stops providing the horizontal transfer pulse to the horizontal transfer portion, and drains the unnecessary charges...” [Emphasis added] Referring to, e.g., Fig. 2 of the present application as shown below, the horizontal transfer pulses (i.e., $\phi H1$ and $\phi H2$) are not provided to the horizontal transfer portion during the "STORAGE PERIOD". As a result, the OB clamping operation (i.e., ϕOB) can be activated during the "STORAGE PERIOD" without concern about the OB clamping malfunction.

FIG. 2



A portion of the specification defines the storage period and read period by describing that “[d]uring the storage period, light incident on the photodiode 1 is photoelectrically converted and stored... At time t2, signal charges stored in the photodiode 1 are read below fV1 electrodes of the vertical transfer portions via the gates 2 in accordance with a signal read pulse superposed on fV1...” See, page 2, lines 6-14 of the specification.

In contrast, none of the references cited by the Examiner teaches an image sensing apparatus where a specific control is performed during the storage period. For example, Wako defines an operation period V starting from a read period (i.e., without a storage period) by describing “[d]uring one vertical period V, charges are read from the photoelectric conversion

elements 15 in the first field into the associated vertical charge transfer element 20..." [Col. 10, lines 59-61 of Wako]. See also, Fig. 5 of Wako where three vertical periods V0, V1 and V2.

Secondly, claim 1 has been amended for further clarification. In particular, amended claim 1 recites, *inter alia*, "an OB clamping circuit which clamps the optical black signal output from the optical black region to a reference voltage, wherein the OB clamping circuit having a switch which inputs the reference voltage from a reference power supply, and a capacitor, wherein the image sensing element is configured in such a way that providing the horizontal transfer pulse to the horizontal transfer portion is stopped, and resetting operation of the charge detection portion and clamping operation of the OB clamping circuit are continued while the signal charges are stored in the photoelectric conversion portion."

As Applicant understand it, none of the references cited by the Examiner teaches "an OB clamping circuit" as recited in amended claim 1. Moreover, amended claim 1 further clarifies that the horizontal transfer pulse is stopped, and the resetting operation of the charge detection portion and the clamping operation of the OB clamping circuit continues while the signal charges are stored in the photoelectric conversion portion.

In view of the above, each of claim 1 as amended, and claims 2-4 each in depending from amended claim 1, is believed neither anticipated by nor rendered obvious in view of the references cited by the Examiner (i.e., Wako and Kondo), either taken alone or in combination, for at least the reasons discussed above. Reconsideration and withdrawal of the rejection of claims 1-4 under 35 U.S.C. §103(a) is respectfully requested.

Applicant has chosen in the interest of expediting prosecution of this patent application to distinguish the cited documents from the pending claims as set forth above. These statements should not be regarded in any way as admissions that the cited documents are, in fact, prior art.

New claim 5 has been amended to recite the claimed invention in an alternative manner. Specifically, new claim 5, reciting similar features to claim 1 deleted by this amendment and depending from claim 1 as amended, is accordingly believed allowable for at least the similar reasons for claim 1 discussed above.

Applicant believes that the application as amended including the new claim is in condition for allowance and such action is respectfully requested.

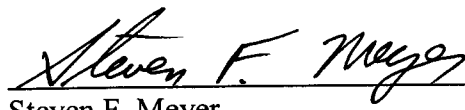
AUTHORIZATION

No petitions or additional fees are believed due for this amendment and/or any accompanying submissions. However, to the extent that any additional fees and/or petition is required, including a petition for extension of time, Applicant hereby petitions the Commissioner to grant such petition, and hereby authorizes the Commissioner to charge any additional fees, including any fees which may be required for such petition, or credit any overpayment to Deposit Account No. 50-4827 (Order No. 1232-5209). A DUPLICATE COPY OF THIS SHEET IS ENCLOSED.

An early and favorable examination on the merits is respectfully requested.

Respectfully submitted,
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Dated: March 2, 2009

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